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Scientific evidence is Met Office focus at Cancun

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Ahead of the latest UN talks on climate change in Mexico, the Met Office analyses long- and short-term trends in climate and reveals that the evidence for man-made warming has grown even stronger in the last year.

There is overwhelming evidence of warming in a wide range of climate indicators, not just surface temperature. The picture for short-term trends is more complicated. Short-term variations are affected by natural variability and other factors as well as long-term warming. In the last 10 years the rate of warming has decreased whilst the rate of loss of sea-ice extent has increased — an apparent contradiction — the Met Office's latest analysis of the science shows that this is entirely consistent with our understanding of how the climate behaves and with our model projections.

In providing the evidence of continued warming and drawing from the work of more than 20 institutions worldwide, the Met Office Hadley Centre compiled results for a range of climate indicators — not just surface temperature. The multiple data sets used for each indicator are from diverse sources such as satellites, weather balloons, weather stations, ships, ocean buoys and field surveys.

Dr Matt Palmer, an ocean observations specialist at the Met Office, said: "It is clear from the observational evidence across a wide range of indicators that the world is warming. As well as a clear increase in air temperature observed above both the land and sea, we see observations which are all consistent with increasing greenhouse gases."

These changes include:

- Increases in water temperature at the sea surface down a depth of hundreds of metres.
- An increase in humidity as a warmer atmosphere holds more moisture.
- Increases in sea level as warmer waters expand and land-ice melts.
- Shrinking of Arctic sea-ice, glaciers and Northern Hemisphere spring snow cover.

Since the late 1970s the long-term rate of surface warming has been about 0.16 °C per decade. However, over the last decade the rate of warming has decreased.

Natural variability within the climate system could explain all of this recent decrease. Other factors could have contributed.

- Changes in stratospheric water vapour
- Solar variability
- Increased aerosol emissions from Asia

The rate of warming has been underestimated in the last decade because of:

- changes to sea-surface temperature measurement practices;
- strong warming in the Arctic — where there are fewer observations.

Dr Vicky Pope said: "Our analysis confirms that the signals of warming are as strong as they ever have been. Improving our understanding of the factors that affect short- and long-term trends is helping us to improve our predictions of the future, helping others to make choices on mitigation and adaptation providing a more resilient future."

Notes to editors

- The Met Office Hadley Centre advises the UK government on climate change research. Its work is, in part, jointly funded by Defra (Department for Environment, Food and Rural Affairs) and DECC (Dept for Energy and Climate Change).
- The Met Office will be represented at COP16 in Cancun by Dr Vicky Pope and other key scientists. Briefing material is available at the conference, on line and on request from the press office – email pressoffice@metoffice.gov.uk

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